## CONTENTS


Editors' preface ix
Opening session, by I. Broser x
Concluding remarks at the closing session, by H.-E. Gumlich xiii

SECTION I. CRYSTAL GROWTH AND EPITAXY

I.A. *Thin films and epilayer growth*

MOVPE of narrow and wide gap II–VI compounds *
J.B. Mullin, D.J. Cole-Hamilton, S.J.C. Irvine, J.E. Hails, J. Giess and J.S. Gough 1
Wide-gap II–VI heterostructures *
R.L. Gunshor, A.V. Nurmikko, L.A. Kolodziejski, M. Kobayashi and N. Otsuka 14
Modulation-doped HgCdTe quantum well structures and superlattices grown by photoassisted molecular beam epitaxy *
J.F. Schetzina, J.W. Han, Y. Lansari, N.C. Giles, Z. Yang, S. Hwang, J.W. Cook, Jr. and N. Otsuka 23
Photoassisted molecular beam epitaxy of wide gap II–VI heterostructures *
R.N. Bicknell-Tassius, A. Waag, Y.S. Wu, T.A. Kuhn and W. Ossau 33
In situ characterization of organometallic growth of ZnSe using grazing incidence X-ray scattering *
D.W. Kisker, P.H. Fuoss, S. Brennan, G. Renaud, K.L. Tokuda and J.L. Kahn 42
Luminescence and electrical properties of ZnSe grown by photo-assisted OMVPE
Sz. Fujita, A. Tanabe, T. Kinoshita and Sg. Fujita 48
Photo-assisted homoepitaxial growth of ZnS by molecular beam epitaxy
M. Kitagawa, Y. Tomomura, K. Nakanishi, A. Suzuki and S. Nakajima 52
An RBS and channelling study of epitaxial layers of $Cd_xHg_{1-x}Te$ grown on GaAs
A.J. Avery, D.J. Diskett, J. Giess and S.J.C. Irvine 56
Laser irradiation during MBE growth of $ZnS_xSe_{1-x}$: a new growth parameter
N. Matsumura, T. Fukada and J. Saraie 61
Photoluminescence spectroscopy of CdTe grown by photoassisted MBE
N.C. Giles, K.A. Bowers, R.L. Harper, Jr., S. Hwang and J.F. Schetzina 67
MOVPE growth and characterization of $Hg_{0.7}Cd_{0.3}Te$ layers
R. Druilhe, F. Desjonquères, A. Katty, A. Tromson-Carli, D. Lorans, L. Svob, A. Heurtel, Y. Marfaing and R. Triboulet 73
Surface reconstruction and stabilization in MOMBE of ZnSe revealed by in-situ RHEED monitoring
Sz. Fujita, N. Yoshimura, Y.-H. Wu and Sg. Fujita 78
Optical properties of ZnSe–ZnTe strained layer superlattices prepared by atomic layer epitaxy
Y. Takemura, S. Dosho, M. Konagai and K. Takahashi 81
"MBE-like" and "CVD-like" atomic layer epitaxy of ZnSe in MOMBE system
A. Yoshikawa, T. Okamoto, H. Yasuda, S. Yamaga and H. Kasai 86
Monolayer epitaxy of ZnSe on GaAs substrates by alternating adsorption of diethylzinc and hydrogenselenide
N. Shibata and A. Katsui 91
HgTe/HgCdTe superlattices: growth, electrical and optical properties
O.K. Wu, J.N. Schulman and G.S. Kamath 96
ZnTe and CdTe:ZnTe superlattices grown by MOVPE
J.T. Mullins, P.A. Clifton, P.D. Brown, A.W. Brinkman and J. Woods 100
Pulsed laser evaporation and epitaxy of $Cd_{1-x}Mn_xTe$
J.J. Dubowski 105


* Invited paper.

Effect of operating conditions and precursors on optoelectronic properties of OMVPE grown ZnSe
K.P. Giapis and K.F. Jensen 111
ZnTe–ZnS strained-layer superlattices grown by ALE and MBE: effects of strain on ZnTe incorporation
T. Karasawa, K. Ohkawa and T. Mitsuyu 118
Simulation of GaAs/CdTe heteroepitaxial growth
M. Djafari Rouhani, M. Laroussi, A. Amrani and D. Estève 122
(111) CdTe molecular beam epitaxy growth on misoriented (001) GaAs substrate
S. Tatarenko, J. Cibert, Y. Gobil, G. Feuillet, E. Ligeon, Le Si Dang and K. Saminadayar 126
Twin-free (Cd, Mn)Te substrates
R. Triboulet, A. Heurtel and J. Rioux 131
Linear and quadratic Zeeman effects on PAMBE grown CdTe
W. Ossau, T.A. Kuhn and R.N. Bicknell-Tassius 135
Growth and characterization of p-type VPE ZnS layers
S. Iida, T. Yatabe, H. Kinto and M. Shinohara 141
MBE growth of (111) CdTe on Zn-stabilized and Se-stabilized (100) ZnSe
Li He, Jianguo Zhong, Jie Li, Jian Lu, Zhonglin Pong, Meifang Yu, Jinbi Yu, Qinxi Xie and Shixin Yuan 147
Characterisation of epitaxial $Cd_xHg_{1-x}Te$ using electrolyte electroreflectance with in-situ electrochemical etching
L.E.A. Berlouis, L.M. Peter, D.J. Diskett, A.J. Avery, M.G. Astles, J. Giess and N.T. Gordon 153
Electrical and structural assessment of CdTe and CdMnTe layers grown by MBE on InSb substrates
D.E. Ashenford, J.H.C. Hogg, D. Johnston, B. Lunn, C.G. Scott and D. Staudte 157
Current transport mechanisms in epitaxial CdS/CdTe heterojunctions
C. Ercelebi, A.W. Brinkman, T.S. Furlong and J. Woods 162
Effect of substrate orientation on crystalline microstructure of HgTe, CdTe and HgCdTe
G. Cinader, A. Raizman and M. Oron 167
Laser-induced MOCVD of ZnO thin films
M. Shimizu, T. Katayama, Y. Tanaka, T. Shiosaki and A. Kawabata 171
Growth of MBE $ZnS_xSe_{1-x}$ using a novel electrochemical sulphur source
K.A. Prior, J.M. Wallace, J.J. Hunter, S.J.A. Adams, M.J.L.S. Haines, M. Saoudi and B.C. Cavenett 176
Growth and characterization of ZnSe grown on GaAs by hot-wall epitaxy
K. Hingerl, H. Sitter, D.J. As and W. Rothemund 180
Characterization of CdS epitaxial films by high energy reflected electrons
C. De Blasi, A.M. Mancini, D. Manno and L. Vasanelli 185
Bulk-like low-temperature photoluminescence from CdTe/GaAs grown by hot-wall epitaxy
T. Schmidt, H. Sitter and K. Lischka 190
Structural and optical properties of $Cd_{0.7}Hg_{0.3}Te$–CdTe heterostructures grown by molecular beam epitaxy
G. Lentz, N. Magnea, H. Mariette, H. Tuffigo, G. Feuillet, J. Fontenille, E. Ligeon and K. Saminadayar 195
Photoluminescence properties of MOVPE grown ZnTe layer on (100) GaAs and (100) GaSb
H.P. Wagner, W. Kuhn and W. Gebhardt 199
MOVPE of high quality ZnSe: role of mismatch on reflectivity and photoconductivity
R.L. Aulombard, A. Averous, O. Briot, J. Calas, D. Coquillat, F. Hamdani, J.P. Lascaray, N. Moulin and N. Tempier 204
Use of $MeMn(CO)_5$ in the low temperature MOCVD growth on Mn containing alloys
G.N. Pain, N. Bharatula, G.I. Christiansz, M.H. Kibel, M.S. Kwietniak, C. Sandford, T. Warminski, R.S. Dickson, R.S. Rowe, K. McGregor, G.B. Deacon, B.O. West, S.R. Glanvill, D.G. Hay, C.J. Rossouw and A.W. Stevenson 208

I.B. *Bulk growth*

The absolute determination of CdTe crystal polarity
P.D. Brown, K. Durose, G.J. Russell and J. Woods 211
"Cold travelling heater method", a novel technique of synthesis, purification and growth of CdTe and ZnTe
R. Triboulet, K. Pham Van and G. Didier 216
Growth and characterization of CdS crystals
C.-H. Su, S.L. Lehoczky and F.R. Szofran 221
Characterization of CdTe crystals by chemical etching and cathodoluminescence measurements
G. Brandt, H. Ennen, R. Moritz and W. Rothemund 226
Structural perfection of $Hg_{1-x}Cd_xTe$ grown by THM
C. Genzel, P. Gille, I. Hähnert, F.M. Kiessling and P. Rudolph 232
X-ray absorption spectroscopy of CdMnTe
A. Kisiel, J. Oleszkiewicz, M. Podgórny, G. Dalba, F. Rocca and E. Burattini 237

Study of p-to-n-type conversion in bulk $Hg_{1-x}Zn_xTe$ near $x = 0.15$
R. Granger, A. Lasbley, A. Seyni, S. Rolland and R. Triboulet 241
Twinning in CdTe
K. Durose and G.J. Russell 246
New defect etchants for CdTe and $Hg_{1-x}Cd_xTe$
I. Hähnert and M. Schenk 251
Crystalline perfection of melt-grown CdTe
M. Azoulay, A. Raizman, G. Gafni and M. Roth 256
Interdiffusion coefficient in $Hg_{1-x}Zn_xTe$ solid solutions
R. Granger, C. Pobla, S. Rolland and R. Triboulet 261
Vertical Bridgman growth of $Cd_{1-y}Zn_yTe$ and characterization of substrates for use in $Hg_{1-x}Cd_xTe$ liquid phase epitaxy
M. Bruder, H.-J. Schwarz, R. Schmitt, H. Maier and M.-O. Möller 266
CdTe and CdZnTe crystal growth by horizontal Bridgman technique
P. Cheuvart, U. El-Hanani, D. Schneider and R. Triboulet 270
Crystalline and chemical quality of CdTe and $Cd_{1-x}Zn_xTe$ grown by the Bridgman method in low temperature gradients
M. Mühlberg, P. Rudolph, C. Genzel, B. Wermke and U. Becker 275

I.C. *Doping methods*

Heat treatment of HgCdTe with Cd–Hg source
Yang Jianrong, Yu Zhenzhong, Liu Jiming and Tang Dingyuan 281
Point defect formation in II–VI semiconductors at pulsed laser irradiation
N.E. Korsunskaya, I.V. Markevich and M.K. Sheinkman 285
p-Type doping by ion implantation into ZnSe epitaxial layers grown by metalorganic vapor phase epitaxy
T. Yodo, K. Ueda and K. Yamashita 289
Identification of Na acceptor in MOCVD-grown ZnS films and the effect of UV light illumination
T. Taguchi, Z. Kawazu, T. Ohno and A. Sawada 294
Extrinsic doping at low concentrations for $Cd_xHg_{1-x}Te$ layers grown by MOVPE
C.D. Maxey, P. Capper, P.A.C. Whiffin, B.C. Easton, I. Gale, J.B. Clegg, A. Harker and C.L. Jones 300
Use of dimethyl hydrazine as a new acceptor-dopant source in metalorganic vapor phase epitaxy of ZnSe
A. Yoshikawa, S. Matsumoto, S. Yamaga and H. Kasai 305
Ag and Cu deposits on HgXTe (X = Cd, Zn) alloys
C. Nguyen Van Huong, R. Triboulet and P. Lemasson 311

SECTION II. THEORETICAL CONCEPTS

Band structure and heterojunctions of II–VI materials *
N.E. Christensen, I. Gorczyca, O.B. Christensen, U. Schmid and M. Cardona 318
Tight-binding calculations of total energies of macroscopic polar electron–core systems: application to II–VI compounds
J. Neugebauer, R. Enderlein and J. Röseler 332
Spin splitting in narrow-gap two-dimensional electron systems
P. Sobkowicz 337
Theory of the dynamical Stark effect of excitons in CdS
R. Zimmermann and M. Hartmann 341
Theory of exciton linewidth in II–VI semiconductor mixed crystals
R. Zimmermann 346
Tunneling current calculated for $Hg_{0.8}Cd_{0.2}Te$ diodes
A. Schenk, M. Stahl and H.-J. Wünsche 350
Tight binding theory for deep-level native point defects in $Hg_{1-x}Cd_xTe$
D. Hennig, M. Hanke and A. Kaschte 355
Band structure and discontinuities of HgTe/CdTe superlattices: a theoretical study
M. Ritze and R. Enderlein 359
Valence band structure of $Cd_{0.7}Hg_{0.3}Te$ determined by angular resolved photoemission
G. Leveque, B. Orsal, R. Alabedra and J.C. Flachet 364
Ligand-field theory for the orbit–lattice and spin–lattice coupling coefficients of $Mn^{2+}$ in ZnS and ZnSe
D. Boulanger and R. Parrot 368

Calculation of band offsetts in strained II–VI heterojunctions
D. Bertho, A. Simon, D. Boiron, C. Jouanin and C. Priester 372
Geometry optimization of $Zn_{1-x}Mn_xS$ structures by SCF CNDO and INDO methods
K.K. Stavrev, K.D. Kynev and G.St. Nikolov 376
Energy transfer between electromagnetic modes near the isotropic point in CdS
G. Czajkowski, K.-H. Pantke, K. Ziebegk and P. Schillak 379

SECTION III. IMPURITIES

Jahn–Teller effect and zero-phonon line isotope shifts of transition metals in II–VI compounds *
A. Hoffmann and U. Scherz 385
Rare earth in II–VI compounds: non-linear optical excitation processes at low and high doping levels *
D. Hommel, W. Busse, H.-E. Gumlich, D. Suisky, J. Röseler, K. Świątek and M. Godlewski 393
Characterization of deep levels in CdTe by photo-EPR and related techniques *
W. Jantsch and G. Hendorfer 404
$Cr^{2+}(d^4)$ infrared emission in CdS and CdSe
G. Goetz, A. Krost and H.-J. Schulz 414
Implantation effects on resonant Raman scattering in CdTe and $Cd_{0.23}Hg_{0.77}Te$
M. Ramsteiner, A. Lusson, J. Wagner, P. Koidl and M. Bruder 420
p-Doping of epitaxial ZnSe using group I elements
J.E. Potts, H. Cheng, J.M. DePuydt and M.A. Haase 425
Photoluminescence and annealing behavior of Ga-doped CdTe crystals
S. Seto, A. Tanaka, K. Suzuki and M. Kawashima 430
Deep rare earth (RE) ions related energy levels in ZnS
K. Świątek, A. Suchocki, H. Przybylińska and M. Godlewski 435
Deuteration effects in chlorine-doped CdTe
L. Svob, A. Heurtel and Y. Marfaing 439
Excited state absorption (ESA) of Mn in ZnS and ZnSe
J. Dreyhsig, U. Stutenbäumer, H.-E. Gumlich and J.W. Allen 443
The influence of high temperature annealing on luminescence and energy transfer in ZnS/Mn crystals
R. Grasser, A. Scharmann and B. Seidel 449
Deep centers in $S^+$ implanted ZnSe
Weirong Ren, Xizhen Yang and Xiwu Fan 454
5d Transition and 4f rare earth elements in II–VI semiconductors as luminescent centres and probes in diagnostics of implanted layers
V.V. Ushakov and A.A. Gippius 458
Luminescent properties of CaS phosphors activated by copper and fluorine
Y. Nakanishi, K. Natsume, Y. Fukuda, G. Shimaoka, H. Tatsuoka, H. Kuwabara and E. Nakazawa 462
Optical investigation of Ni impurity in ZnSe under hydrostatic pressure
D. Wasik, Z. Liro and M. Baj 466
Jahn–Teller effect of $CdS:Fe^{2+}$ and $CdSe:Fe^{2+}$
E.E. Vogel, M.A. De Orúe, J. Rivera-Iratchet and J.E. Morales 470
Middle infrared photoluminescence mapping of II–VI semiconductor wafers
H. Schmidt, J.W. Tomm and K.H. Hermann 474
The behavior of phosphorus implanted CdTe
C.Y. Sun, Y.J. Hsu and H.L. Hwang 479
Investigation of the $Mn^{2+} \rightarrow Mn^{2+}$ energy transfer using time-resolved ODMR
K. Zink, H. Nelkowski and J. Sahm 484
Excited states of acceptors in CdTe and ZnTe
M. Said and M.A. Kanehisa 488
Observation by $^{57}Fe$ Mössbauer spectroscopy of iron as electron traps and of the relaxation of these transient states in ZnTe and ZnS
A. Gérard, C. Garcin and P. Imbert 493
Optical and electrical properties of heavily indium-doped CdS around the semiconductor–metal phase transition
I. Broser, R. Broser and E. Birkicht 497
A new 1.47 eV defect-luminescence band in MOCVD-grown CdTe on (100) GaAs
C. Onodera and T. Taguchi 502

Investigations of the temperature dependent $Fe^{2+}(3d^6)$ resonant donor level in HgSe : Fe
W. Szuszkiewicz, Qian Dingrong, C. Julien, Zhang Jiaming, M. Jeżewski, M. Balkanski and A. Mycielski 507
Study of Hg vacancies in (Hg, Cd)Te after THM growth and post-growth annealing by positron annihilation
R. Krause, A. Klimakow, F.M. Kiessling, A. Polity, P. Gille and M. Schenk 512
Photo-ESR characterization of donor and acceptor impurities in ZnS
M. Godlewski and A. Zakrzewski 517
Long range Mn ion pairs and other Mn related centers in ZnS detected by site-selected spectroscopy
U.W. Pohl and H.-E. Gumlich 521
Optical properties of oxygen-doped ZnSe crystals
M.P. Kulakov and V.D. Negriy 525
Many-electron multiple effects in the spectra of Ni and Co in II–VI semiconductors
A. Bouhelal and J.P. Albert 528
Fine structure of the $Cu^{2+}$ centre in CdS
A. Hoffmann, I. Broser, P. Thurian and R. Heitz 532
Optical and optically detected magnetic resonance investigations on the A-center complex in CdTe
D.M. Hofmann, B.K. Meyer, U. Probst and K.W. Benz 536

SECTION IV. SURFACES AND INTERFACES, THIN FILMS, SUPERLATTICES AND QUANTUM WELLS

Magneto-optics in II–VI compound type III superlattices *
Y. Guldner and J. Manassès 540
Optoelectronic properties of ZnSe–GaAs interfaces: role of interface chemistry and structural defects
D.J. Olego and D. Cammack 546
Effects of electric field on ZnSe/ZnS strained-layer superlattices
T. Yokogawa, T. Saitoh and T. Narusawa 550
Photoluminescence of wide bandgap II–VI superlattices
K.P. O'Donnell, P.J. Parbrook, B. Henderson, C. Trager-Cowan, X. Chen, F. Yang, M.P. Halsall, P.J. Wright and B. Cockayne 554
Electronic structure, effective masses and non-linear optical response in $Hg_{1-x}Cd_xTe$–$Hg_{1-y}Cd_yTe$ and $Hg_{1-x}Cd_xTe$–$Cd_{1-y}Zn_yTe$ superlattices
M. Jaros, A. Zoryk, A.W. Beavis and I. Morrison 559
MIS structures on $Hg_{1-x}Cd_xTe$/CdTe/GaAs epilayers
M. Lang and K. Lischka 566
High resolution X-ray diffraction studies of $Cd_xHg_{1-x}Te$/CdTe epitaxial layers grown by MOVPE on GaAs substrates
A.M. Keir, A. Graham, S.J. Barnett, J. Giess, M.G. Astles and S.J.C. Irvine 572
Surface radiative recombination in CdS crystals
V.V. Travnikov 579
Effect of deposition temperature on the electrical properties of p-type $Hg_{0.8}Cd_{0.2}Te$–ZnS interface
I. Esquivias, E. Linares, E. Iborra and J. Sangrador 584
Investigation of the CdTe/GaAs interface by the X-ray rocking curve method
A. Pesek, T.W. Ryan, R. Sasshofer, E.J. Fantner and K. Lischka 589
Spectroscopic determination of the band offset in $CdTe/Cd_{1-x}Mn_xTe$ multiple quantum wells grown on InSb substrates
T.J. Gregory, C.P. Hilton, J.E. Nicholls, W.E. Hagston, J.J. Davies, B. Lunn and D.E. Ashenford 594
Photoluminescence as a probe of semiconductor surfaces: CdTe and CdS
Z. Sobiesierski, I.M. Dharmadasa and R.H. Williams 599
Deformation potentials of CdTe epilayers from piezo and wavelength modulation reflectivity spectra analysis
J. Allègre, B. Gil, J. Calatayud and H. Mathieu 603
XPS study of the $Zn_xHg_{1-x}Te$ alloys: core levels and valence-band offset
A. Marbeuf, D. Ballutaud, R. Triboulet and Y. Marfaing 608
Cyclotron resonance excitation spectroscopy of CdTe and of CdTe/CdZnTe quantum wells
B. Lavigne and R.T. Cox 611
Spectroscopic evidence for piezoelectric effects in wurtzite CdS/CdSe strained-layer superlattices
M.P. Halsall, J.E. Nicholls, J.J. Davies, P.J. Wright and B. Cockayne 616
Valence band offset and interface chemistry of II–VI epitaxial layers grown on the (110) surface of III–V materials
W.G. Wilke, R. Seedorf and K. Horn 620

Spectroscopy in CdTe/MnTe and ZnTe/MnTe single quantum wells; new binary wide gap II–VI heterostructures
N. Pelekanos, Q. Fu, A.V. Nurmikko, S. Durbin, J. Han, Sungki O, D. Menke, M. Kobayashi and R.L. Gunshor 628

SECTION V. OPTICAL PROPERTIES

Nonlinear optical properties of wide-gap II–VI bulk semiconductors and microcrystallites *
F. Hennenberger, J. Puls, H. Rossmann, U. Woggon, S. Freundt, Ch. Spiegelberg and A. Schülzgen 632
Ultrafast optical nonlinearities in II–VI compounds *
B. Fluegel, M. Joffre, S.H. Park, R. Morgan, Y.Z. Hu, M. Lindberg, S.W. Koch, D. Hulin, A. Migus, A. Antonetti and N. Peyghambarian 643
Optical properties of $CdTe/Cd_{1-x}Zn_xTe$ quantum wells and superlattices *
Y. Merle D'Aubigné, H. Mariette, N. Magnea, H. Tuffigo, R.T. Cox, G. Lentz, Le Si Dang, J.-L. Pautrat and A. Wasiela 650
Excitonic luminescence and the effect of high excitation in ZnSe–ZnS strained-layer superlattices grown on ZnS substrates
Y. Yamada and T. Taguchi 661
High-density luminescence and excitation spectroscopy of MBE-grown ZnSe/GaAs epilayers
G. Kudlek, N. Presser, J. Gutowski, S. Durbin, D. Menke, M. Kobayashi and R.L. Gunshor 667
Systematic photoluminescence study of $Cd_xHg_{1-x}Te$ alloys in a wide composition range
A. Lusson, F. Fuchs and Y. Marfaing 673
Picosecond transient gratings in $CdS_{1-x}Se_x$ mixed crystals
C. Dörnfeld, G. Noll, H. Schwab, J.M. Hvam, Ch. Weber, R. Renner, E.O. Göbel, A. Reznitsky, V. Lyssenko, S.A. Pendjur, O.N. Talensky and C. Klingshirn 678
Dynamics of free exciton luminescence in $Cd_xZn_{1-x}Te/ZnTe$ quantum wells
R.P. Stanley, J. Hegarty, R. Fisher, J. Feldmann, E.O. Göbel, R.D. Feldman and R.F. Austin 683
Dielectric properties of narrow-gap semiconductors
K. Kumazaki 687
Mechanism of the temperature dependence of bound-exciton photoluminescence of CdTe crystals
H. Zimmermann, R. Boyn, C. Michel and P. Rudolph 691
Optically bistable thin film devices using wide-gap II–VI compounds
H.J. Eichler, V. Glaw, A. Kummrow, V. Penschke and A. Wahi 695
Nonlinear spectroscopy of deep levels in wide-gap II–VI semiconductors
R. Baltramiejūnas and V. Gavryushin 699
Optical study of ZnSe and (Zn, Mn)Se MBE layers on GaAs
W. Heimbrodt, O. Goede, Th. Köpp, R. Enderlein, M. Pessa and J. Lilja 705
Density of states model and photoluminescence spectra of localized excitons in ZnHgTe and CdHgTe alloys
D. Ouadjaout, Y. Marfaing, A. Lusson and A. Heurtel 709
Exciton absorption in $CdS_{1-x}Se_x$ and $ZnSe_{1-x}Te_x$ solid solutions
A. Naumov, S. Permogorov, A. Reznitsky, S. Verbin and A. Klochikhin 713
Absolute absorption coefficients of ZnTe single crystal layers: experiment and theory
B. Langen, H. Leiderer, W. Limmer, W. Gebhardt, M. Ruff and U. Rössler 718
Fourier transform infrared photoluminesce of $Hg_{1-x}Cd_xTe$
F. Fuchs, A. Lusson, P. Koidl and R. Triboulet 722
Strain-induced splitting of free exciton band in epitaxially grown ZnSe on GaAs
H. Saito, M. Ohishi, A. Watanabe and K. Ohmori 727
Optical dephasing in CdSSe mixed crystals studied by coherent transient grating experiments
G. Noll, U. Siegner, E.O. Göbel, H. Schwab, R. Renner and G. Klingshirn 731
The electron–hole plasma in cubic ZnTe and ZnSe crystals
M. Kunz, T. Pier, R.N. Bhargava, A. Reznitsky, V.I. Kozlovskii, G. Müller-Vogt, J.C. Pfister, J.L. Pautrat and C. Klingshirn 734
Novel size effects in excitonic spectra of thin II–VI single crystals
G.V. Mikhailov, A.G. Panfilov and B.S. Razbirin 739
Luminescence of heavily doped, highly excited CdS : In crystals
U. Neukirch, I. Broser and R. Rass 743
Frequency doubling and phase matching with II–VI microcrystals
S. Colak and J. Khurgin 748
Photopumped lasing in ZnSSe/ZnSe multilayer structures up to 210 K
I. Suemune, H. Masato, K. Nakanishi, K. Yamada, Y. Kan and M. Yamanishi 754
Thermally induced optical bistability in II–VI semiconductor crystals and thin films
A. Schmidt, M. Müller, J. Grohs, M. Kunz, A. Daunois, V. Kažukauskas, A. K. Kar, H. Bartelt and C. Klingshirn 758

Optical characterization of ultra-high-purity zinc selenide epilayers
K. Shahzad, D.J. Olego and D.A. Cammack 763
Exciton transfer between localized states in $CdS_{1-x}Se_x$ alloys: time-resolved photoluminescence and theoretical models
C. Gourdon and P. Lavallard 767
Electron–hole plasma relaxation in CdTe
J.H. Collet, W.W. Rühle, M. Pugnet, K. Leo and A. Million 773
Optical properties of excitons in II–VI quantum wells: importance of centre-of-mass quantization
H. Tuffigo, R.T. Cox, G. Lentz, N. Magnea and H. Mariette 778
Exciton states and LO-phonon resonant Raman scattering in CdTe/ZnTe superlattices
Y. Garini, E. Cohen, A. Ron and H. Shtrikman 783
Middle infrared photoluminescence (PL) in the $Hg_{1-x}Cd_xTe$ ($0.22 \leq x \leq 0.75$) system
L. Werner, J.W. Tomm, J. Tilgner and K.H. Herrmann 787
Free-carrier absorption due to collective and one-particle processes in a linear conduction band
W. Bardyszewski, W. Szuszkiewicz, Qian Dingrong and Zhang Jiaming 792
Photoconduction and thermo-optical hysteresis measurements in thin CdS films
Ch. Bouchenaki, B. Ullrich, J.P. Zielinger, H. Nguyen Cong and P. Chartier 797
Fine structure of the excitonic absorption spectra and interband magneto-optics of CdTe crystals
M.A. Abdullaev, O.S. Coschug, S.I. Kokhanovskii and R.P. Seisyan 802

SECTION VI. TRANSPORT

Transport properties of II–VI semimagnetic semiconductors *
T. Dietl 808
p-Type carrier concentration control in lithium-doped zinc selenide grown by MOCVD
H. Mitsuhashi, A. Yahata, T. Uemoto, A. Kamata, M. Okajima, K. Hirahara and T. Beppu 818
Galvanomagnetic properties of p-CdTe and p-$Hg_{1-x}Cd_xTe$
P. Höschl, P. Moravec, V. Prosser, R. Kužel, R. Grill, J. Franc, E. Belas and Yu.M. Ivanov 822
Picosecond photoconductivity of CdSe and CdTe thin films
J. Vaitkus, R. Tomašiūnas, J. Kutra, M. Petrauskas, R. Rinkūnas and A. Žindulis 826
Photo-Hall model for space charge effects in n-ZnSe/GaAs : Cr heterostructures
S. Colak, H. van Houten, T. Marshall and D.A. Cammack 828
p-Type conduction of ZnSe highly doped with nitrogen by metalorganic molecular beam epitaxy
M. Migita, A. Taike, M. Shiiki and H. Yamamoto 835
Deep levels governing the transport mechanism in p–n HgMnTe diodes
L. Dobaczewski, E. Janik and G. Karczewski 841
Hall mobility and conductivity in $Zn_xCd_{1-x}S$ mixed crystals
M.K.B. Saidin, G.J. Russell, A.W. Brinkman and J. Woods 844
Control of the resistivity of MOCVD zinc selenide by post-growth annealing
Jiazhen Zheng and J.W. Allen 850
Influence of deep level intrinsic defects on the carrier transport in p-type $Hg_{1-x}Cd_xTe$
W. Hoerstel, A. Klimakow and R. Kramer 854
Carrier drift mobilities and PL spectra of high resistivity cadmium telluride
K. Suzuki, S. Seto, A. Tanaka and M. Kawashima 859
Electrical properties of $Hg_{1-x}Cd_xTe$ ($x = 0.21$) annealed by immersion in a hot mercury bath
C. Uzan-Saguy, D. Laser and R. Kalish 864
Shubnikov–De Haas effect under hydrostatic pressure in HgSe : Fe
C. Skierbiszewski, T. Suski, W. Dobrowolski and J. Kossut 869
Resistivity and high magnetic field Hall effect measurements on as-grown p-type HgZnTe
P. Fajardo, J. Sanz-Maudes, T. Rodriguez, M.A. González and R. Triboulet 872
Ballistic transport in alkaline earth sulfides
H.-J. Fitting, A. von Czarnowski and G.O. Müller 876

SECTION VII. SEMIMAGNETICS

Free and bound exciton in II–VI semimagnetic compounds *
S.I. Gubarev 882

Holes in semimagnetic semiconductors *
B.L. Gelmont 890
Resonant Raman scattering by LO phonons in $Cd_{0.8}Mn_{0.2}Te$ near the $E_0$ gap in external magnetic fields
W. Limmer, S. Bauer and W. Gebhardt 895
Anti-crossing of Raman lines: bound magnetic polaron in $Cd_{1-x}Fe_xSe$
D. Scalbert, J.A. Gaj, A. Mauger, J. Cernogora and C. Benoit à la Guillaume 900
Magneto-excitons in CdTe–(CdMn)Te quantum wells
W. Ossau, S. Fisher and R.N. Bicknell-Tassius 905
Optical study of the antiferromagnetic phase transition in (Cd, Mn)S at highest Mn concentration
W. Heimbrodt, C. Benecke, O. Goede and H.-E. Gumlich 911
Resonant photoelectron spectroscopy on ZnMnS at the Mn 3p–3d and Mn 2p–3d threshold
R. Weidemann, B. Burmester, H.-E. Gumlich, Ch. Jung, T. Kleemann, T. Kreitler, A. Krost, H.-U. Middelmann, U. Becker, M. Kupsch and S. Bernstorff 916
Resonant Raman scattering by optical phonons in ZnSe and $Zn_{0.97}Mn_{0.03}Se$ near the $E_0$ gap
H. Leiderer, W. Limmer and W. Gebhardt 921
Investigations on the cation d-levels of wide gap semimagnetic semiconductors
Ch. Jung, H.-E. Gumlich, A. Knack and H.-C. Mertins 926
Chemical trends of the luminescence in wide band gap $II_{1-x}Mn_xVI$ semimagnetic semiconductors
C. Benecke, W. Busse and H.-E. Gumlich 931
Nearest and next nearest neighbor exchange interaction between magnetic ions in II–VI semimagnetic semiconductors
A. Bruno and J.P. Lascaray 936
Resonant Raman scattering on low energy excited states of $Fe^{2+}$ in $Cd_{1-x}Fe_xSe$
D. Scalbert, J.A. Gaj, A. Mauger, J. Cernogora, C. Benoit à la Guillaume and A. Mycielski 940

SECTION VIII. ELECTROLUMINESCENCE

Bleu spontaneous and stimulated emission in VPE ZnSe epilayers *
X.W. Fan, Z.K. Tang and H. Tian 944
Conductivity control of ZnSe grown by MOVPE and its application for blue electroluminescence *
H. Kukimoto 953
Thin-film electroluminescent devices using Cas and SrS *
S. Tanaka 958
Ballistic transport and electroluminescence in IIB–VI and IIA–VI compounds
R. Mach and G.O. Müller 967
Thin film electroluminescence of $Zn_{1-x}Mn_xS_{1-y}Te_y$
P. Benalloul, J. Benoit, A. Geoffroy, D. Yebdri, R. Bilewicz, W. Busse, H.-E. Gumlich and R. Rebentisch 976
Electroluminescence from minory carrier injection produced by deep-level impact-ionisation
T.D. Thompson and J.W. Allen 981
Magnetic effects in electroluminescence of ZnS : Mn films
A.E. Belyaev, Ya.F. Kononetz, Yu.G. Semenov and N.A. Vlasenko 985
Decay of ZnS : Mn emission in thin films – revisited
P. Benalloul, J. Benoit, R. Mach, G.O. Müller and G.U. Reinsperger 989
Thin film electroluminescence of $ZnS : Tb^{3+}$
V.S. Khomchenko, Ya.F. Kononec, N.A. Vlasenko, R. Mach, G.U. Reinsperger, B. Selle and R. Reetz 994
Efficient ZnS-like alkaline earth sulfide electroluminesence
G.O. Müller, R. Mach, B. Selle and H. Ohnishi 999
Preliminary trial of third generation electroluminescence (EL)
Xu Xurong, Lei Gang, Shen Mengyan and Zhao Guozhang 1004
Injection luminescence in oxygen-doped ZnSe grown by molecular beam epitaxy
K. Akimoto, T. Miyajima and Y. Mori 1009

SECTION IX. II–VI APPLICATIONS, MISCELLANEOUS

Integration of a CdTe interdigitated photoconductor with an AlGaAs field-effect transistor
J.L. Filippozzi, F. Therez, D. Estève, M. Fallahi, D. Kendil, M. Da Silva, M. Barbe and G. Cohen-Solal 1013

Highly conductive Ga-doped polycrystalline (Zn, Cd)S films
D. Schmid, R.H. Mauch, M. Hofmann, R. Schäffler and H.W. Schock 1018
Vibrations of constituent atoms in $Zn_xCd_{1-x}Te$ and $Hg_{1-x}Cd_xTe$ (various $x$)
D. Comedi and R. Kalish 1022

Author index 1027
Subject index 1040